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Total Maximum Daily Loads

A Technical Introduction to TMDLs

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This brochure introduces you to an important water quality tool: Total Maximum Daily Loads, also called TMDLs. Following are detailed answers to essential questions about TMDLs and related topics. More information is available on EPA's web site at www.epa.gov/r10earth/tmdl.htm.

What is a 303(d) listed waterbody?

Section 303(d) of the federal Clean Water Act requires states to identify waterbodies that do not meet state clean water goals, called water quality standards. The list of identified waterbodies is called the state's 303(d) list. A waterbody on this list is often referred as an "impaired" or "listed" waterbody.

The 303(d) listing is specifically related to the particular standard that is exceeded. This means that if a waterbody contains a pollutant in excess of the standard, then the waterbody must be listed for that pollutant. Section 303(d) requires states to develop Total Maximum Daily Loads (TMDL) for those pollutants.

The TMDL program does not establish any new implementation authority. The TMDLs are to be implemented using existing federal, state, and local authorities and under voluntary programs.

What is a TMDL?

A TMDL is a "pollution budget" for a polluted waterbody, which:

- provides a written assessment of water quality problems,
- identifies the pollutant sources that contribute to the problems, and
- sets pollutant allocations for these sources.

What is the TMDL process?

The TMDL process provides a flexible assessment and planning framework to identify which pollutants must be reduced and by how much. The TMDL process has three steps:

1. States must identify and prepare a list of waters that do not or are not expected to meet water quality standards after applying existing required controls (e.g. sewage treatment).

2. States must prioritize waters and develop TMDLs for high priority waters first.

3. For listed waters, States must develop TMDLs that will achieve water quality standards, allowing for seasonal variations and an appropriate margin of safety. A TMDL is a quantitative assessment of water quality problems, contributing sources, and load reductions needed to restore and protect individual waterbodies.

State water quality agencies are usually responsible for carrying out the TMDL process. EPA reviews and approves lists of waters requiring TMDLs, and specific

TMDLs. If EPA disapproves lists or TMDLs, EPA must establish the lists and/or TMDLs. Landowners, other agencies, and other stakeholders can often assist States or EPA in developing TMDLs for specific watersheds.

What pollutant sources do TMDLs cover?

TMDLs should address all significant threats to water quality:

- point sources (e.g., sewage treatment plant discharges),
- nonpoint sources (e.g. runoff from fields, streets, range or forest land), and
- naturally occurring sources (e.g., runoff from undisturbed lands).

A TMDL is like a pollution budget. It is the sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources and natural background pollutants, plus an appropriate margin of safety. TMDL plans may address individual pollutants or groups of pollutants, as long as they clearly identify the links between:

- the waterbody use impairment or threat of concern,
- the causes of the impairment or threat, and
- the load reductions needed to meet water quality standards.

What are TMDLs based on?

TMDLs are usually based on readily available information and studies. In some cases, complex studies or models are needed to understand water quality problems. In many cases, simple analytical efforts provide an adequate basis for assessment and planning.

Where there is not enough information to draw precise links between these factors, TMDLs may be developed through a phased approach. The phased or adaptive management approach enables states to use available information to establish interim targets, begin to implement needed controls and restoration actions, monitor waterbody response to these actions, and plan for future TMDL review and revision. Adaptive management or phased approach TMDLs are particularly appropriate to address nonpoint source issues.

What if the information used to develop the TMDL is found to be wrong or inaccurate after the TMDL has been issued? Can TMDLs be revised?

TMDLs can be revised based on new information or data.

What are the key components of a TMDL?

Problem Statement: A description of the waterbody or watershed, beneficial uses that are affected, and pollutants or stressors causing the impairment.

Numeric Targets: For each pollutant addressed in the TMDL, measurable indicators and numeric targets which express the desired condition for beneficial uses of water.

Source Analysis: An assessment of relative contributions of pollutant or stressor sources or causes to the use impairment and extent of needed discharge reductions/controls.

Loading Capacity Estimate: An estimate of the assimilative capacity of the waterbody for the pollutant(s) of concern–how much of a pollutant a waterbody can receive without exceeding standards.

Allocations: Allocation of loads or load reductions among sources of concern, providing a margin of safety. These allocations are usually expressed as wasteload allocations to point sources and load allocations to nonpoint sources. The TMDL equals the sum of allocations and cannot exceed the loading capacity.

Monitoring Plan (optional): Plan to monitor the effectiveness of the TMDL and schedule for reviewing and, if necessary, revising the TMDL.